

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

South Point Plant Site, South Point, Lawrence County, Ohio

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the South Point Plant Site (Plant) located in Perry Township in the Village of South Point, Lawrence County, Ohio, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to the extent practicable. This decision is based upon the contents of the Administrative Record for the site.

The State of Ohio has indicated a willingness to concur with this decision. A written confirmation is expected, and will be added to the administrative record upon receipt.

ASSESSMENT OF THE SELECTED REMEDY

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

United States Environmental Protection Agency (U.S. EPA) has selected a remedy that is intended to be the final action for the Plant. The remedy was presented in the Proposed Plan as Remedial Alternative RA-5A. The following is a summary of the selected remedy:

- Active Area
 - Institutional controls
 - Excavation:
 - Mid-Plant Area and Coke-Oven Gas Blowdown Areas
 - Disposal:
 - On-site consolidation in Eastern Disposal Area - Mid-Plant Area
 - Off-site disposal - Mid Plant Area and Coke Oven Gas Blowdown Area
- Inactive area
 - Institutional controls
 - Containment:
 - Consolidation and placement of a Single barrier cover - Disposal Area D
 - Single barrier cover - Eastern Disposal Area
 - Surface controls - Northern Fly Ash Ponds

- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohic River

Estimated Cost - \$3,910,800

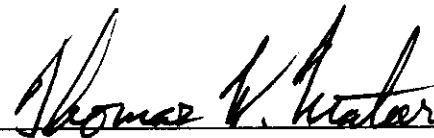
Also, as part of RA-5A, some additional characterization will be required in the area of the former melamine ponds during the remedial design. The extent of this additional data collection will be determined during the remedial design planning phase.

DECLARATION STATEMENT

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for the site. If soils from the Coke-Oven Gas Blowdown Area or potential hot-spots identified in the Mid-Plant Area fail the Toxicity Characteristic Leaching Procedure (TCLP) and need to be treated prior to off-site disposal, then the statutory preference for treatment as a principal element of the remedy would be achieved. However, if the excavated soils do not need to be treated and because treatment of the additional principal threats at the site was not found to be practicable, this remedy would not satisfy the statutory preference for treatment as a principal element of the remedy.

Because hazardous substances will remain at the site, U.S. EPA will conduct a five-year review in accordance with Section 121 of CERCLA to assess whether any other response is necessary.

26 Sep 97
DATE



William E. Muno
Superfund Division Director

**U.S. EPA Superfund
Record of Decision**

South Point Plant Site

**South Point, Lawrence County, Ohio
September 1997**

TABLE OF CONTENTS

I.	Site Description.....	1
II.	Site History and Enforcement Activities.....	1
III	Highlights of Community Participation.....	3
IV.	Scope and Role of Response Action.....	4
V.	Site Characteristics.....	5
VI.	Summary of Site Risks.....	8
VII.	Description of Remedial Alternatives.....	11
VIII.	Evaluation of Alternatives.....	16
IX.	Statutory Determinations.....	25
X.	Explanation of Significant Differences.....	26
XI.	State Concurrence.....	26

FIGURES

Figure 1 Site Location Map

Figure 2 Site Base Map

TABLES

Table 1 Evaluation Table

Table 2 South Point PRGs

APPENDICES

Appendix A - Responsiveness Summary

Appendix B - Administrative Record

DECISION SUMMARY

I. Site Description

The South Point Plant Site (Plant) is located in Perry Township in the Village of South Point, Lawrence County, Ohio (Figure 1). The Plant, which covers approximately 610 acres, is located on a relatively flat portion of the Ohio River terrace within the eastern floodplain of the river. Along the east side of the Plant, Solida Creek, a small intermittent stream, flows from the southeast to northwest. Solida Creek and the Ohio River, along with their associated smaller tributaries represent the natural surface water drainage within the Plant (Figure 2).

The Plant is situated on a relatively uniform silt and fine sand unit which is generally 7 to 10 feet thick, and is comprised of 50 to 60 percent silt, 30 to 40 percent clay, and 10 percent sand. Underlying these surface sediments is 70 to 100 feet of unconsolidated, alluvial, and glacial outwash sediments which rest on bedrock. These sediments comprise the principal aquifer of the area. Groundwater in the aquifer is present under unconfined conditions and is found at an average depth-to-water of 45 feet. In general, groundwater flows toward the Ohio River.

II. Site History and Enforcement Activities

The Plant was constructed in 1943 by the federal government for the production of ammonium nitrate explosives. In 1946, Allied Chemical purchased the Plant and produced ammonia, urea, nitrogen fertilizer solution, melamine, formaldehyde, and urea formaldehyde mixtures until 1978. Ashland Oil purchased the facility in 1979. Ashland demolished and removed many of the existing Plant's structures and constructed a coal-water fuel pilot plant and a pitch prilling test plant which formed pitch into small pellets. Both the pilot plant and the test plant have been dismantled. In 1981, South Point Ethanol (SPE) acquired an 80-acre tract in the middle of the former production area for ethanol production. In 1985, Cardox, a division of the Air Liquide Corporation, began leasing a portion of the SPE track for liquid carbon dioxide production. SPE ceased operation in August 1995. Air Liquide discontinued operation in January 1997. In addition, portions of the Plant property are leased for agricultural purposes.

Manmade features currently visible on the property include: the Northern Fly Ash Ponds, the Eastern Disposal Area, Disposal Area D, numerous railroad sidings, the SPE facility, the Cardox facility, and several miscellaneous structures. The Mid-Plant Area, Coke-Oven Gas Blowdown Area, and the Ammonium-Nitrate Production Area are locations of activities which may have caused contamination, however, these areas are not readily identifiable to casual observers (see Figure 2).

From 1943 to the mid-1980s, plant refuse, coal cinder, small quantities of laboratory chemicals, asbestos-insulation materials, waste lubrication oils, by-product and off-specification solids (such as ammonium nitrate, urea, and melamine), and waste lubrication oils were disposed in the following areas:

- **Eastern Disposal Area** - This 13-acre area was in operation from 1946 to 1965. This area received Plant refuse and debris, coal cinders, and small quantities of chemicals from an on-site laboratory. It may also have received asbestos insulation materials, ammonium nitrate, urea, melamine, and waste lubrication oils. Most of the area is covered by grasses, shrubs, and trees except for the northern portion which lacks vegetation. The Eastern Disposal Area is not lined or capped with a non-permeable substance, such as clay. Waste material deposited in this area may go as deep as 30 feet.
- **Disposal Area D** - This 2-acre area received wastes from the mid-1960s until July 1977. This area received similar waste to that found in the Eastern Disposal Area and also may have received copper ammonium acetate. The surface of this area is a mixture of slag and construction debris which does not support vegetation. The waste in Disposal Area D is about 12 feet deep. This area is in the flood plain of Solida Creek and is severely eroded.
- **Melamine Ponds** - Use of the ponds appears to have begun in the late 1960s. The ponds received melamine manufacturing process byproducts and at one time contained three to four feet of a mixture of solids and water. In late 1979, the pond was drained and the solids were excavated and landfilled. Following excavation, the ponds were regraded and a parking lot and building were constructed in its place. In 1996, a storage tank that is unrelated to the site, was removed from the general area of the former melamine ponds. While the soil samples taken were for verifying completion of the tank removal, field observations indicated possible residual contamination from the former melamine ponds.
- **Northern Fly Ash Ponds** - The ponds began accepting fly ash and cinders from onsite coal-fired boilers in the mid-1950s. The fly ash attains its greatest thickness (30 feet) along the east edge of the ponds. The 40-acre pond area, which is inactive, is not capped or lined but is covered by grasses, shrubs, and trees.

Other facilities and activities which may have caused contamination include:

- **The Ammonium Nitrate Production Area** - This area is part of the Mid-Plant Area and is near the center of the site.
- **The Coke-Oven Gas Blowdown Area** - This area is northwest of the Mid-Plant Area. Coke-oven gas from a coke facility was piped beneath the Ohio River to the Plant and used as a fuel. Three 25-gallon drip pots are located along the coke-oven gas line to collect condensation.
- **Reactors and associated iron-oxide catalysts** - These units are located on the north side of the Mid-Plant Area. Thirty-six tons of an iron-oxide were stored in 6 reactors on the site.
- **Waste lubrication oil disposal activities** - A portion of the waste oil was disposed of in the Eastern Disposal Area.

- Arsenic trioxide packaging disposal activities - These activities which involved burning wooden kegs in an old railroad car used to transport the kegs from the production area to the Eastern Disposal Area.

A number of releases have occurred at the site between 1943 and 1979. The four major releases are described below:

- In the mid-1950s nitrogen-phosphate-potash fertilizer stored in the Mid-Plant Area caught fire. Millions of gallons of water were used to fight the fire. The water washed large quantities of fertilizer components to the site grounds and storm sewers.
- In November 1971, a tank in the Mid-Plant Area ruptured, spilling about 500,000 gallons of liquid ammonium nitrate. The majority of the contents discharged to a storm sewer that emptied into the Ohio River.
- In November 1977, a portion of the northern dike of the Northern Fly Ash Ponds failed, releasing significant quantities of fly ash, water and earthen materials from the dike into Solida Creek.
- In February 1978, the eastern dike wall of the Melamine Pond failed, releasing an estimated 100,000 gallons of water containing 1,600 pounds of ammonia nitrogen and 6,000 pounds of organic nitrogen into the Ohio River through the main outfall. In addition, an unknown quantity of the solution was discharged to the site grounds.

On September 21, 1984, the Plant was added to the National Priorities List (NPL). The NPL is a list of sites in the country that are eligible for study and cleanup, if necessary, under the Superfund program. The U.S. EPA identified Allied-Signal, Inc., Ashland Oil, Inc., and SPE, Inc. as potentially responsible parties (PRPs) for the site. In May 1987, a Consent Order was signed by the U.S. EPA, the OEPA, and the PRPs requiring the development of an RI and FS.

On November 26, 1991, a letter was sent out by the U.S. EPA outlining the resolution of a dispute initiated by a letter dated October 18, 1991, from the PRPs concerning the South Point Plant Site Conceptual Site Model.

Field activities associated with the RI were conducted during the period of 1989 through 1992. The RI was completed in August 1994 and approved on September 21, 1994. The FS was completed in May 1997 and approved in July 1997.

III. Highlights of Community Participation

In August 1995, U.S. EPA hosted an Availability Session and released a fact sheet documenting the conclusion of the RI. Community participation and concerns at the site have been minimal.

Information repositories have been established at the South Point Mayor's office, 408 Second Street, and the Briggs Lawrence Library, 317 Solida Road, South Point, Ohio. U.S. EPA maintains a copy of the administrative record for the site in the information repository. A Proposed Plan was made available on August 14, 1997. A public meeting was held on August 26, 1997, to discuss the Proposed Plan. Advertisements were placed in local newspapers to announce the public meeting and comment period. A public comment period for the Proposed Plan was established from August 14, 1997, to September 12, 1997. The public generally supports the selected remedy. The responsiveness summary is contained in Appendix A.

The public participation requirements of CERCLA Sections 113 (k)(2)(B) (i-v) and 117 of CERCLA have been met in the remedy selection process. This decision document presents the selected remedy for the South Point Superfund site, chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. The decision for this site is based on the Administrative Record.

IV. Scope and Role of Response Action

The purpose of this Record of Decision (ROD) is to select the final remedial action for the Plant. This final remedy controls sources and prevents the further migration of contaminants. The remedy addresses all media and migration pathways that are considered to present an unacceptable risk, including landfilled wastes, contaminated soils and groundwater.

Impacted soils in the active area will be removed off-site or consolidated on-site in the Eastern Disposal Area and capped. If soils from the Coke-Oven Gas Blowdown Area or potential hot-spots identified in the Mid-Plant Area fail the Toxicity Characteristic Leaching Procedure (TCLP) and need to be treated prior to off-site disposal, then the statutory preference for treatment as a principal element of the remedy would be achieved. However, if the excavated soils do not need to be treated and because treatment of the additional principal threats at the site was not found to be practicable, this remedy would not satisfy the statutory preference for treatment as a principal element of the remedy.

The mobility of constituents to groundwater within the wastes in the inactive area and active area would be reduced through capping and removal of contaminated soils in specific areas. In addition, continued operation of the current groundwater pumping system will contain groundwater on-site and will remove contaminants from groundwater.

This decision is based on an analysis of site risks, described in detail below.

V. Site Characteristics

Onsite work conducted during the RI included sampling of soil, groundwater, sediment, and surface water. Onsite sources of contamination at the site were also characterized through the review of historical records, a well survey, geophysical surveys, and evaluation of historical aerial photographs. The key findings of the RI are summarized below.

Physical Features

1. Soils

The Plant is underlain by a thick section of unconsolidated material (70 to 100 feet thick). This material, consisting of alluvial and glacial outwash sediments, forms the major aquifer of the area. The sediments are composed primarily of fine to medium grained, quartz sand with a low silt and clay content. The exception to these fine to medium grained sediments is an isolated coarse sand and gravel lens which is located within the upper portion of the main sand body at the south side of the Plant. Overlying the sand and gravel is a relatively uniform silt and fine sand unit which is generally 7- to 10-feet thick. The unit attains a maximum thickness of about 20 feet. In some areas proximal to Solida Creek, the silt and sand unit is underlain by silt and clay deposits ranging in thickness from 5 to 10 feet.

2. Hydrology

Solida Creek, Willow Creek and the Ohio River represent the natural surface water bodies near the Plant. Along the east side of the Plant, Solida Creek a small intermittent stream, flows from southeast to northwest paralleling the bedrock valley walls. The creek is present in a small 20- to 40-foot deep, steep walled valley, topographically separating the Plant from the bedrock hills. A small tributary to Solida Creek, Willow Creek, joins it east of the site. Along the west side of the Plant, the topography drops abruptly to the Ohio River. Over a linear distance of about 2000 feet the land surface drops approximately 20 feet in elevation to a narrow, flat terrace before descending another 25 feet to the river creating a relatively steep bank.

3. Hydrogeology

Groundwater at the Plant is found in an unconsolidated aquifer under unconfined conditions. The average depth to groundwater is 45 feet. The average saturated thickness of the aquifer is 38 feet. Groundwater velocities have been calculated to range from 3.9 ft/day to 19 ft/day. Four well fields are present in the Plant vicinity; three Plant well fields (Western, Eastern, and Central Well Fields) and the South Point Municipal Well Field. In 1983, the Village of South Point and the Plant reached an agreement to maintain a hydraulic barrier between the Plant and the municipal well fields. Regional groundwater flow is radial toward the center of the Plant due to the influence of the Plant well fields.

4. Ecology

Three state endangered bird species, the mourning warbler, golden-winged warbler, and northern waterthrush were identified on the site. In addition, the dwarf dandelion, a state threatened plant species, was identified on the site. The bird species are migratory and are considered to be transient visitors to the site and not residents. Due to the limited migratory period when the birds are possibly on the site and the low potential for contaminant exposure via their food sources, the potential for the site to represent a hazard to these bird species is considered low. The dwarf dandelion was observed in a disturbed area southwest of the Northern Fly Ash Ponds which is unlikely to represent a hazard to the species because this area was not reported to have received waste materials.

An assessment of risks to aquatic organisms potentially exposed to contaminants detected in surface water and sediments of Solida Creek was conducted, although it is unlikely that this creek supports a diverse and established assemblage of organisms due to its intermittent nature (i.e., dry during periods of the year). The low concentrations of contaminants detected in surface water and sediments from Solida Creek are not expected to represent an ecological hazard. The findings of the Ecological Assessment indicate that based on the relatively low constituent concentrations reported in the environmental media (generally low bioconcentration factors of the compounds of ecological concern and limited evidence of stress to resident biological communities), there is no evidence that conditions at the Plant represent a threat to ecological receptors.

5. Contamination

Soils

One hundred and ninety-nine soil samples were obtained from 69 onsite locations, including 9 background locations. The background sampling locations were used to determine normal soil conditions in the area. The soil samples, both surface soil and soil borings, were primarily from the following areas: the Northern Fly Ash Ponds, the Eastern Disposal Area, Disposal Area D, the Mid-Plant Area, and the Coke Oven Gas Blowdown Area. These are the primary areas of suspected soil contamination. Contaminants found in these areas include volatile organic compounds (VOCs and semi-VOCs), waste specific compounds (ammonia, nitrate/nitrite, and sulfate), and metals (arsenic, barium, beryllium, cadmium, copper, and selenium). Cyanide was also found in the Coke Oven Gas Blowdown Area. The contaminants found are consistent with the activities conducted at the site during the Plant's operational years. In general, contaminants are concentrated within 10 feet of the surface and decrease rapidly as depth increases.

Groundwater

Groundwater samples were taken from 10 monitoring wells, 7 production wells, 3 residential wells (two north of the site and one south of the site), 3 observation wells, and 2 municipal wells located

near the Ohio River. Analytical results indicate that groundwater quality has been affected by the Eastern Disposal Area, Disposal Area D, the Mid-Plant Area, and the Northern Fly Ash Ponds. Exceedances of drinking water standards or primary MCLs are restricted to cadmium and nitrate/nitrite levels. Cadmium levels also exceed the MCL in background samples. Other constituents, primarily sulfates, iron, and manganese, exceeded groundwater quality standards, or secondary MCLs. Some high levels of ammonia were also found in the groundwater. In addition, there are two areas with high values of total dissolved solids (TDS) and high specific conductance. TDS and specific conductance are two indicators of groundwater quality. The first area is centered on the northern part of the Northern Fly Ash Ponds immediately adjacent to Disposal Area D. The second area extends from the Eastern Disposal Area into the Mid-Plant Area. These conditions are consistent with disposal activities and groundwater flow patterns at the site.

Prior to the start-up of SPE operations at the site in 1981, there had been evidence that the Village of South Point's municipal wells may have been affected by the groundwater contamination at the site, particularly nitrate/nitrite contamination. Some of the city's wells were located between the site and the Ohio River. SPE installed a number of groundwater wells to pump water for cooling off ethanol production lines and for use in some industrial processes. Excess water from the industrial process was treated, mixed with the non-contact water, and discharged through an Ohio EPA National Pollutant Discharge Elimination System (NPDES) permit into the Ohio River. These wells effectively contained ground water under the site and, when in use, they have eliminated the potential for contaminated groundwater to affect the city's municipal wells. This existing groundwater containment system will continue pumping as part of any remedy to ensure the city's wells are not affected. In addition, the NPDES permit will need to be kept up to date and in compliance with the Ohio EPA.

Surface Water

Six surface water and six sediment samples were obtained during the RI. Background samples were collected from Solida Creek and an adjacent creek upstream of the site. The data indicates that there is no apparent change in surface water quality as it passes through the site, with the exception of a slight increase in lead content in one sample upstream of the site and one onsite sample.

Sediment

Sediment quality results indicate that the site is not contributing contaminants to the sediments of Solida Creek.

During the RI, consideration was given to the various site-specific pathways by which contaminants could migrate from the site. As a part of this process surface runoff and contaminated groundwater were determined to have incomplete pathway migration. The migration pathway for surface runoff was considered incomplete because surface water and sediment data from Solida Creek was not found to be impacted. Solida Creek directly borders the disposal areas at the site and would be considered the closest surface water body, while the Ohio River is approximately 2000 feet from the

closest onsite disposal area. Groundwater at the site, while contaminated, was already being addressed by the groundwater containment system that was in place prior to the RI. As mentioned previously, the pumping system, while in operation, effectively contains groundwater under the site and removes mass contaminants. The presence of the containment system alleviated the impact of contaminated groundwater on the Ohio River. Major releases at the site may also have impacted the Ohio River. However, because of the short duration of these events and the timeframes that had past since the releases had occurred, the U.S. EPA determined that these events were not significant sources of contamination to the Ohio River.

Based on the results of the RI, U.S. EPA examined the threats to human health and the environment through exposure by ingestion and/or direct contact with contaminants in ground water, and in subsurface and surface soils.

VI. Summary of Site Risks

Based on data collected during the RI, the PRPs assessed human health and ecological risks associated with contaminants detected in groundwater, soils, and surface water within and near the Plant. This assessment, called a baseline screening, was approved by the U.S. EPA. The baseline screening was conducted to compare contamination levels at the site with U.S. EPA standards. As part of the screening, the PRPs considered ways in which people and wildlife could be exposed to site-related contaminants and whether such exposure could increase the incidence of cancer and noncarcinogenic (noncancer related) diseases above the levels that normally occur in the study area.

The PRPs also assumed that people could be exposed to site-related contaminants by eating them (ingestion), breathing them (inhalation), or absorbing them through the skin (dermal contact). The contaminants of concern are the VOCs, semi-VOCs, metals, and waste-specific compounds of nitrate and ammonia found in onsite soil and groundwater.

Current land use and reasonably anticipated future use of the land at NPL sites are important considerations in determining current risks, future potential risks, and the appropriate extent of remediation. (See "Land Use in the CERCLA Remedy Selection Process," OSWER Directive No. 9355.7-04, May 25, 1995). Land use assumptions affect the exposure pathways that are evaluated in the risk assessment. The results of the risk assessment aid in determining the degree of remediation necessary to ensure current and long-term protection at the site. The risk assessment considers present use of the site to determine current risks. It may restrict its analysis of future risks to the reasonably anticipated future land use.

Current and future land use conditions were assessed by the PRPs in the screening. Under current land use conditions, risks to three populations were assessed: onsite workers, adult trespassers, and child trespassers. Under future land use conditions, risks were assessed for on-site construction workers, on-site industrial workers, adult on-site residents, and child on-site residents. Even though,

future risks were assessed for residential use, it is reasonably anticipated that future use at the site will remain industrial.

Because of the uncertainty in segregating and apportioning risks for each source area, the site was separated into active and inactive areas. The active area included source areas of the site where industrial activities were concentrated, primarily the Mid-Plant Area and the Coke Oven Gas Blowdown Area. The inactive area included the waste disposal source areas, Disposal Area D, the Northern Fly Ash Ponds, and the Eastern Disposal Area. Risks to the current and future users were assessed separately for the inactive and active areas.

Potential risks to public health for cancer are expressed numerically, i.e., 1×10^{-4} or 1×10^{-6} . Carcinogenic risk expressed as 1×10^{-4} means that one out of 10,000 people exposed to contamination over a 70-year lifetime could potentially develop cancer as a result of the exposure. A carcinogenic risk of 1×10^{-6} means that one out of 1,000,000 people exposed over a 70-year lifetime could potentially develop cancer as a result of the exposure. U.S. EPA has established a carcinogenic risk range from 1×10^{-4} to 1×10^{-6} in an attempt to set standards for remediation and protectiveness. The measure of noncarcinogenic risk is termed a hazard index (HI) and is also expressed numerically. When the HI exceeds 1, there is a potential for adverse health effects.

The risk assessment uses a conservative estimate when evaluating a potential risk. This provides a high level of protection for public health and the environment. For example, in some of the risk estimates, the PRPs assume that the site will be developed for future residential land use and that residents will regularly use contaminated groundwater for drinking and bathing. Therefore, the excess lifetime cancer risk estimates should be regarded as conservative estimates of potential cancer risk rather than actual representations of true cancer risk.

Current Potential Human Health Risks

Three different groups of people currently could be exposed to contamination at the inactive and active areas. The three different groups that currently could be exposed include:

- Current on-site workers
- Adult trespassers
- Child trespassers

Workers at the SPE plant were considered to be the current on-site worker population. While the area occupied by the SPE plant was not considered to be an area that caused contamination at the site, the risk associated with its proximity to contaminated areas was assessed. In other words, although there was no evidence that SPE employees were exposed to contaminated media at the site, the potential for infrequent exposure existed.

Current on-site workers ingesting contaminated groundwater and ingesting, inhaling, and contacting contaminated surface soils in the inactive area could increase their risk of developing cancer by

7×10^{-6} .

Current on-site workers ingesting contaminated groundwater and ingesting, inhaling, and contacting surface soils in the active area could increase their risk of developing cancer by 8×10^{-6} .

Currently on-site adult and child trespassers ingesting, inhaling, and contacting surface soils in the active area could increase their risk of developing cancer by 9×10^{-5} .

Current on-site adult and child trespassers ingesting, inhaling and contacting surface soils in the active area could increase their risk of developing cancer by 1×10^{-4} .

The only exposures that poses a potential noncancerous health risk are to the child and adult trespasser in the inactive area.

Additionally, for the inactive areas, it was determined that the landfills are considered a continuing source of groundwater contamination.

Even though the current groundwater pumping system effectively contains contaminated groundwater on-site and removes mass contaminants, exceedances of MCLs, primarily nitrate/nitrite, were observed in groundwater beneath the site.

Tables 7-31 thru 7-53 of the South Point Baseline Risk Assessment, found in the South Point Remedial Investigation Report, dated August 1994, contain individual exposure doses and risk calculations for each constituent of concern and exposure pathway used to calculate the cumulative risks for the inactive and active areas.

Future Potential Human Health Risks

In addition to the current exposures described above, four additional groups of people could be exposed in the future:

- Future on-site construction workers
- Future on-site industrial workers
- Future on-site adult residents
- Future on-site child residents

For each of the groups that could be exposed in the future, a conservative approach was taken to assume that construction workers, industrial workers, and/or residents could potentially work or live on contaminated portions of the site if no remediation took place. Because of this approach, more direct and frequent exposures to contamination were assumed, by the PRPs, for future workers and residents than for current workers. As evidenced below, for the future industrial worker and future residents this assumption created potentially far greater risk.

Future on-site construction workers ingesting groundwater and ingesting, inhaling, and contacting shallow soils in the inactive area could increase their risk of developing cancer by 6×10^{-6} .

Future on-site construction workers ingesting groundwater and ingesting, inhaling, and contacting shallow soils in the active area could increase their risk of developing cancer by 7×10^{-6} .

Future on-site industrial workers ingesting groundwater and ingesting, inhaling, and contacting shallow soils in the active area could increase their risk of developing cancer by 3×10^{-4} .

Future on-site adult and child residents ingesting, inhaling, and contacting groundwater, surface waters, sediments, and shallow soils in the active and inactive areas could increase their risk of developing cancer by 4×10^{-4} .

Exposure to contaminants by future on-site residents in the inactive and active areas and industrial workers in the active area also poses a noncancerous health risk.

In addition, because of the presence of the current groundwater pumping system, which has effectively contained contaminated groundwater on-site and removed mass contaminants, an analysis was conducted to determine the potential off-site impacts to the municipal water supply if the system was discontinued. Modeling conducted during the RI indicated the groundwater quality off-site could be affected if the current pumping regime is discontinued, potentially resulting in risk to the municipal water supply due to exceedances of the MCLs.

Tables 7-31 thru 7-53 of the South Point Baseline Risk Assessment, found in the South Point Remedial Investigation Report, dated August 1994, contain individual exposure doses and risk calculations for each constituent of concern and exposure pathway used to calculate the cumulative risks for the inactive and active areas.

Ecological Risk Assessment

It is possible for wildlife to be exposed to contaminants detected in surface soils, surface waters, and sediments, either through direct ingestion, inhalation, or contact or through indirect ingestion of previously exposed plants and animals. However, no evidence of stress to wildlife was observed during the field investigation.

Resident biota could be exposed to contamination but it is not expected to represent a concern.

VII. Description of Remedial Alternatives

Remedial Action Objectives

The following remedial action objectives (RAOs) address the media of concern (soil and groundwater) to provide short and long-term protection of human health and the environment and to meet the applicable or relevant and appropriate requirements (ARARs).

Surface Soil

- Minimize potential ingestion and dermal contact of contaminated surface soils (metals, carcinogenic polycyclic aromatic hydrocarbons [c-PAHs]) in the inactive and active areas by current and future human receptors.
- Excavate arsenic contaminated soils in the Mid-Plant Area which exceeds the arsenic preliminary remedial goal to reduce risk associated with dermal contact and ingestion of contaminated surface soils by current and future human receptors.

Soil

- Excavate drip pots and the surrounding impacted soil to reduce risk associated with dermal contact and ingestion of contaminated soils (c-PAHs) associated with the drip pots in this area by current and future human receptors.

Groundwater

- Prevent ingestion of contaminated groundwater (nitrates, ammonia, metals) under the Plant by future human receptors.
- Restore quality of local groundwater under the Plant.

Soil and groundwater remedial technologies were screened, by the PRPs, to determine whether they were applicable to the constituents of concern, effective, and implementable at the Plant, and whether they met the RAOs. In addition, relative cost of the remedial technologies was evaluated. Remedial technologies retained after this initial screening were assembled into remedial measures for the active area, inactive area, and groundwater. Remedial measures were evaluated for effectiveness, implementability, and relative cost. The retained remedial measures were assembled into site-wide remedial alternatives.

Remedial Measures

A description of the retained remedial measures are listed below.

- Institutional Controls - deed restrictions, fencing, and monitoring to limit future site usage to industrial activities and lessen the chance for exposure of local populations to site contaminants.
- Surface Controls - slope stabilization, erosion control, enhancement of existing vegetation.

- Vegetated Soil Cover - replace existing poorly vegetated as well as other vegetated areas with a new soil layer and vegetation.
- Single Barrier Cover - replace the existing surface with a low-permeable layer and vegetation. The single barrier cover will be designed to fully meet Ohio solid waste cap requirements.
- Dual Barrier Cover - replace existing surface with a synthetic membrane, a low permeable layer, and vegetation. The dual barrier cover would be designed to fully meet Ohio hazardous waste cap requirements.
- Excavation - removal of contaminated soils within a specified area.
- Stabilization - solidification of excavated soils by mixing them with a stabilizing agent.
- Consolidation - minimize waste distribution by relocating wastes or excavated soils within a limited area designed to contain the waste.
- Off-site Disposal - transfer waste or excavated soils to an approved off-site landfill.
- Bioremediation - use of microorganisms to degrade waste.
- Groundwater Decontamination - use of extraction wells to contain and remove mass contaminants from groundwater flow. Determining when to shut the extraction well system down will require an evaluation of the contamination remaining in groundwater to determine if there are exceedances of federal and state standards and/or deviations from the acceptable cumulative Hazard Index.

The retained remedial measures are then combined to form site-wide remedial alternatives. The alternatives evaluated are listed below.

Summary of Remedial Alternatives

Remedial Alternative RA-1:

No Action

- Estimated Cost: \$0

Under this alternative, the potential human health and environmental risks associated with exposure to contaminants would not be mitigated. The inclusion of the "no action" alternative is required by law to give U.S. EPA a basis for comparison.

Remedial Alternative RA-2:

- Active Area
 - Institutional controls
 - Excavation - Coke-Oven Gas Blowdown Areas and the Mid-Plant Area
 - Treatment: Ex-situ stabilization-Coke Oven Gas Blowdown Areas
 - Disposal/On-site consolidation in the Eastern Disposal Area
- Inactive Area
 - Institutional controls
 - Containment:
 - Single barrier cover - Disposal Area D
 - Surface controls - Eastern Disposal Area
- Groundwater
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohio River
- Estimated Cost: \$1,932,750

Remedial Alternative RA-2 incorporates institutional controls, treatment, on-site consolidation, containment, and off-site discharge.

Remedial Alternative RA-3:

- Active Area
 - Institutional controls
 - Excavation - Coke-Oven Gas Blowdown Areas and the Mid-Plant Area
 - Treatment:
 - Ex-situ stabilization - Coke-Oven Gas Blowdown Areas
 - Disposal/On-site consolidation in Eastern Disposal Area
- Inactive Area
 - Institutional controls
 - Containment:
 - Single barrier cover - Disposal Area D
 - Surface controls - Northern Fly Ash Ponds
 - Vegetated soil cover - Eastern Disposal Area
- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohio River

- Estimated Cost: \$3,314,720

This alternative is identical to RA-2, with the exception of surface controls at the Northern Fly Ash Ponds and a vegetated soil cover for the Eastern Disposal Area.

Remedial Alternative RA-4

- Active Area
 - Institutional controls
 - Excavation - Coke-Oven Gas Blowdown Areas and Mid-Plant Area
 - Off-site disposal
- Inactive area
 - Institutional controls
 - Containment:
 - Single barrier cover - Disposal Area D
 - Surface controls - Eastern Disposal Area
- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohio River
- Estimated Cost: \$2,159,770

Remedial Alternative RA-5

- Active Area
 - Institutional controls
 - Excavation - Coke-Oven Gas Blowdown Areas and Mid-Plant Area
 - Treatment:
 - Ex-situ stabilization - Coke-Oven Gas Blowdown Areas
 - Disposal/On-site consolidation in the Eastern Disposal Area
- Inactive Area
 - Institutional controls
 - Containment:
 - Single barrier cover - Disposal Area D
 - Single barrier cover - Eastern Disposal Area
- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:

Ohio River

- Estimated cost: \$3,848,010

Remedial Alternative RA-6

- Active Area
 - Institutional controls
 - Excavation - Coke-Oven Gas Blowdown Areas and Mid-Plant Area
 - Treatment:
 - Ex-situ bioremediation - Coke-Oven Gas Blowdown Areas
 - Ex-situ stabilization - Mid-Plant Area
 - Off-site disposal
- Inactive Area
 - Institutional controls
 - Containment:
 - Dual barrier cover - Disposal Area D
 - Vegetated soil cover - Northern Fly Ash Ponds
 - Dual barrier cover - Eastern Disposal Area
- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohio River
- Estimated Cost: \$7,927,550

VIII. Evaluation of Alternatives

The National Contingency Plan (NCP), Section 300.430 (f)(I), requires that the alternatives be evaluated on the basis of the nine evaluation criteria.

U.S. EPA used the nine criteria to evaluate each of the alternatives. The evaluation criteria are: (1) Overall protection of human health and the environment; (2) Compliance with Applicable or Relevant and Appropriate Requirements (ARARs); (3) Long-term effectiveness and permanence; (4) Reduction of contaminant toxicity, mobility, or volume through treatment; (5) Short-term effectiveness; (6) Implementability; (7) Cost; (8) State Acceptance, and (9) Community Acceptance. These criteria are summarized below and followed by a comparison of the alternatives with regard to these nine evaluation criteria. Table 1 is a summary of the analysis of all the alternatives.

Threshold Criteria

The selected remedy must meet the following threshold criteria;

1. **Overall protection of human health and the environment** This criterion is used to evaluate whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** This criterion is used to evaluate whether the alternative meets federal and state environmental statutes, regulation, and other requirements that pertain to the site or whether a waiver is justified.

Primary Balancing Criteria

The balancing criteria are used to compare the effectiveness of the remedies.

3. **Long-term effectiveness and permanence** This criterion considers whether an alternative permanently maintains protection of human health and the environment, and the effectiveness of such protection.
4. **Reduction of contaminant toxicity, mobility, or volume through treatment** This criterion is used to evaluate whether a particular treatment reduces the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. **Short-term effectiveness** This criterion is used to consider the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. **Implementability** This criterion is used to consider the technical and administrative feasibility of implementing the alternative, such as relative availability of goods and services.
7. **Cost** This criterion is used to estimate capital and operation and maintenance costs, as well as present worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollars.

Modifying Criteria

The following criteria are used to assess support agency and community response to the alternatives.

8. **State Acceptance** This criterion is used to consider whether the State agrees with U.S. EPA's analyses and recommendations of the RI/FS and the Proposed Plan.
9. **Community Acceptance** This criterion is used to evaluate the public comments and will be addressed in the Record of Decision (ROD). The ROD will include a responsiveness summary

that presents public comments and U.S. EPA's responses to those comments. Acceptance of the recommended alternative will be evaluated after the public comment period.

1. Overall Protection of Human Health and the environment

RA-1 is not protective. RA-2 through RA-6 are protective. Implementation of RA-2, RA-3, RA-5, and RA-6 would result in reduction of mobility through treatment, while implementation of RA-6 would also result in reduction of toxicity through treatment. RA-1 and RA-4 do not involve treatment for the reduction of toxicity, mobility, and volume of wastes. Short-term risks posed to on-site construction workers during implementation of RA-2 through RA-6 can be effectively mitigated by using engineering controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

RA-1 would not meet the remedial action objectives and would not comply with ARARs. RA-2 through RA-6 comply with ARARs, with the exception of the cover system proposed for the Eastern Disposal Area in RA-2, RA-3, RA-4, and RA-5.

RA-1, the no action alternative, will not comply with location-specific ARARs for the protection of floodplains and wetlands. RA-2 through RA-6, when implemented, will comply with all location-specific ARARs. RA-1 will not comply with chemical-specific ARARs for inorganic health-based COCs. RA-2 through RA-6, when implemented, will comply with all chemical-specific ARARs. These five alternatives include a site-wide groundwater monitoring program to determine the effectiveness of aquifer restoration and compliance with groundwater remedial goals. RA-1 will not comply with action-specific ARARs concerning management of solid and hazardous waste and the protection of groundwater. RA-2 through RA-5, when implemented, will partially comply with action-specific ARARs. Implementing surface controls (RA-2), a vegetated soil cover (RA-3), or a single barrier cover (RA-4 and RA-5) in the Eastern Disposal Area, will not meet the regulations regarding final closure and post-closure care of hazardous waste landfills. An ARAR waiver is justifiable for a single barrier cover based on the "equivalent standard of performance" criteria. Even though there is evidence that potentially hazardous material was disposed of in the Eastern Disposal Area, the RI has determined that contaminants related to these potentially hazardous materials have been detected at only moderate and not high levels. Therefore, placement of a single barrier, solid waste cap, meeting solid waste ARARs, on the Eastern Disposal Area is acceptable.

3. Long-term effectiveness and permanence

Waste would remain on-site after the implementation of any of the alternatives. RA-1 would not reduce risks. Therefore, the magnitude of residual risk would be the same as current risks. Residual risks associated with RA-2 through RA-6 would include contained wastes in the inactive area which can be controlled through cover system maintenance and institutional controls. Residual risks remaining in the active area are within the U.S. EPA acceptable risk-based range. Risks remaining in the groundwater will be acceptable once the aquifer is restored.

Since waste would remain on-site after implementation of all of the alternatives, measures would be implemented to control risks associated with the wastes, except for RA-1. Deed restrictions would prohibit future residential use of the Plant property. The Plant perimeter fence would reduce the potential for future trespasser exposure to soils in the active area and inactive area in RA-2 through RA-6.

Except for RA-1, all of the alternatives would provide covers over the remaining wastes in the inactive area. Cover systems are frequently used to control land disposed wastes and are proven to be reliable in eliminating exposure to wastes. Single and dual barrier covers would provide an equivalent level of protection from direct exposure, unless a barrier failure occurs. Similarly, vegetated soil covers would provide adequate protection to minimize direct exposure.

Institutional controls in the Northern Fly Ash Ponds would function as reliably as vegetated soil covers (RA-2 and RA-4) since this area currently sustains thick vegetation. The waste disposal areas would be included within the Plant perimeter fence to reduce the potential for exposure and a cover inspection program would be implemented with each alternative (except RA-1) to evaluate the need for repairs to the covers. In addition, a long term groundwater monitoring program would be conducted to evaluate the effectiveness of the cover system.

Exposure to groundwater would be controlled in each alternative, excluding RA-1, by maintaining the existing groundwater pumping system and implementing deed restrictions and groundwater monitoring. The existing pumping system at the Plant has been proven to be reliable in containing groundwater plumes within the Plant boundaries and removing mass contaminants. Deed restrictions would adequately prohibit the potential for the water beneath the Plant to be used for residential purposes. Long-term groundwater monitoring would be implemented with RA-2 through RA-6 to verify the effectiveness of the groundwater plume containment system.

4. Reduction of contaminant toxicity, mobility, or volume through treatment

RA-2, RA-3, and RA-5 include ex-situ stabilization of approximately 375 yd³ of soil from the active area. RA-6 would implement ex-situ bioremediation of approximately 375 yd³ of soil from the Coke-Oven Gas Blowdown Areas and ex-situ stabilization of approximately 4000 yd³ of soil from the Mid-Plant Area. RA-1 and RA-4 would not implement treatment.

5. Short-term effectiveness

RA-2 through RA-6 would require less than 30 years to achieve adequate protection. RA-1 would not achieve protection. The time controlling factor is aquifer restoration. However it is highly unlikely that 30 years would be required, since groundwater pumping at the Plant has proven to be effective at contaminant removal, as indicated by the production well monitoring data. An average of one well per calendar-year quarter exhibits concentrations above the remedial goals for nitrates and ammonia. In general, low concentrations of nitrates and ammonia exist across the site.

6. Implementability

RA-2 through RA-6 are all achievable and operable at the Plant. RA-2, RA-3, RA-5, and RA-6 require treatment which may result in minor implementation and operation and maintenance concerns. Except for RA-1, all of the remedial alternatives involve implementing cover systems of various types in the inactive area. These cover systems are easily implemented. The equipment, materials and specialists required for the implementation of RA-2 through RA-6 are all available.

7. Cost

The implementation costs increase with the increasing level of technical requirements for cover systems in the inactive area. RA-2, RA-4, and RA-5 are considered to be the most cost effective that also provide acceptable levels of protection.

8. State Acceptance

The State of Ohio has indicated a willingness to concur with this decision. A written confirmation is expected by September 30, 1997 and will be added to the administrative record upon receipt.

9. Community Acceptance

Residents in the vicinity of the Plant are in favor of the selected remedy since it will prevent the further migration of contaminants and remove contaminant sources.

Selected Remedy

The selected remedy is a slight modification to Remedial Alternative RA-5. The modified RA-5 was proposed as Remedial Alternative RA-5A in the Proposed Plan.

Remedial Alternative RA-5A

- Active Area
 - Institutional controls
 - Excavation:
 - Mid-Plant Area and Coke-Oven Gas Blowdown Areas
 - Disposal:
 - On-site consolidation in Eastern Disposal Area - Mid-Plant Area
 - Off-site disposal - Mid Plant Area and Coke Oven Gas Blowdown Area
- Inactive area
 - Institutional controls
 - Containment:
 - Consolidation and placement of a Single barrier cover - Disposal Area D
 - Single barrier cover - Eastern Disposal Area
 - Surface controls - Northern Fly Ash Ponds

- Ground Water
 - Institutional controls
 - Containment:
 - Existing pumping containment system
 - Discharge:
 - Ohio River

Estimated Cost - \$3,910,800

RA-5A includes institutional controls for the Active Area, Inactive Area, and groundwater.

For groundwater remediation, RA-5A includes containment and removal of mass contaminants through continued operation of the existing system. Monitoring will be conducted. Preliminary remedial goals (PRGs) established for groundwater in the FS can effectively assess the progress of groundwater containment and removal of mass contaminants. Table 2 contains groundwater PRGs for the South Point Plant site. However, determining when to shut the system down will require an evaluation of the contamination remaining in groundwater to conclude if there are exceedances of maximum contaminant levels (MCLs) and/or deviations from the acceptable cumulative Hazard Index (HI). It is necessary to continue, pumping of the site until the combined HI of all contaminants is less than 1.

For the Inactive Area, RA-5A proposes, single barrier caps for the Eastern Disposal Area and Disposal Area D, similar to what is proposed in RA-5. Some detail and clarification has been added to the remediation of Disposal Area D, involving consolidation and stabilization of the area as described in RA-2, RA-3, RA-4, and RA-5 because of its precarious location on the slope of Solida Creek. Even though there is evidence that potentially hazardous material was disposed of in the Eastern Disposal Area, the RI has determined that contaminants related to these potentially hazardous materials have been detected at only moderate and not high levels. Therefore, the remedy supports the placement of a single barrier, solid waste cap, meeting solid waste ARARs, on the Eastern Disposal Area. Under this scenario the U.S. EPA invokes the CERCLA waiver for Equivalent Standard of Performance for hazardous waste ARARs. In addition, the U.S. EPA is recommending surface controls for the Northern Fly Ash Ponds, as described in the RA-3.

For the Active Area, including the Mid-Plant Area and the Coke-Oven Gas Blowdown Area, RA-5A proposes excavation similar to that described in the FS for each of the alternatives requiring action. However, RA-5A includes a combination of on-site consolidation and off-site disposal for excavated soils as variously described in RA-2, RA-3, RA-4, RA-5, and RA-6. Treatment of soils from the Coke-Oven Gas Blowdown Areas has been replaced by off-site disposal as described in RA-4. TCLP analysis of excavated material will be performed to determine if treatment is necessary prior to off-site disposal.

For the Mid-Plant Area, arsenic contamination in soils was determined to be the main chemical of concern driving clean-up. Upon reviewing the concentrations of arsenic present at the site, the U.S.

EPA determined that a natural break in the data extended to a range of 40 ppm. The U.S. EPA supports this value as a clean-up standard for arsenic in soils. U.S. EPA's assessment of the appropriate exposure assumptions and risk associated with a 40 ppm clean-up standard is that the value is still well within the acceptable risk range of 1×10^{-4} to 1×10^{-6} . The value actually falls around 1.7×10^{-5} . The U.S. EPA supports a strict set of guidelines for clean-up of the Mid-Plant Area. These guidelines are summarized below:

- A boundary to the Mid-Plant area, roughly consistent with current estimated boundaries, will be delineated in the field. This boundary will then be used to define the extent of excavation in the Mid-Plant area.
- The delineated Mid-Plant area will be divided into a northern and southern portion. In dividing the Mid-Plant Area, the southern portion should contain all sampling points that based on the existing RI data indicate arsenic to be present above 40 ppm.
- Remedial Design sampling will be conducted to delineate the lateral extent of arsenic contamination in the first 1.5 feet of soil within the Mid-Plant area by gridding both the northern and southern portions.
- The northern portion will be sub-divided into 300 ft. grids. At a minimum, four to six samples will be taken in each grid and composited for analysis. If a composite sample exceeds the clean-up standard, either the grid may be subdivided into smaller grids to further delineate the areas within the 300 ft. grid exceeding the clean-up standard to be excavated or all the soils within the 300 ft. grid can be excavated to a depth of 1.5 feet. Post excavation sampling of all grids excavated in the northern portion of the site will be required. Post-excavation sampling will be from the bottom of the hole and will include, at a minimum, four to six samples. Samples can be composited for analysis. Sidewall sampling will not be required.
- The southern portion will be sub-divided into 100 ft. grids. At a minimum, four to six samples will be taken in each grid and composited for analysis. If a composite sample exceeds the clean-up standard, either the grid may be subdivided into smaller grids to further delineate the areas within the 100 ft. grid exceeding the clean-up standard to be excavated or all the soils within the 100 ft. grid can be excavated to a depth of 1.5 feet. Post excavation sampling of all grids excavated in the southern portion of the site will be required. Post-excavation sampling will be from the bottom of the hole and will include, at a minimum, four to six samples. Samples can be composited for analysis. Sidewall sampling will not be required.
- When sampling a grid space that contains concrete slabs, sampling will be required adjacent to the concrete slabs. If the analytical results indicate concentrations below the arsenic clean-up standard no further sampling will be required. If the concentrations exceed the arsenic clean-up standard, excavation will be conducted up to the slab. The slab and any soils underneath need not be excavated. However, samples will need to be taken underneath the existing concrete slab by coring through the cement to characterize the soil underneath. In addition, further evaluation

on remedial alternatives may be necessary depending on the arsenic concentrations found underneath a slab.

- If initial grid characterization efforts indicate that a grid will require excavation, an x-ray fluorescence (XRF) field screening instrument may be used to evaluate smaller grids and/or locate hot-spots within a grid. This same instrument will also be used to conduct post-excavation characterization. However, limitations of the use of the XRF instrument as a field-screening in-situ tool need to be taken into consideration. These limitations include the ability of the instrument to detect low concentrations of arsenic, possibly around 30 to 40 ppm, and detecting concentrations at depths beyond the initial few millimeters of topsoil. Additionally, confirmational sampling and laboratory analysis will be required.
- If post-excavation characterization indicates that the base of the grids require further excavation, the additional excavation will be done in 6-inch lifts.
- Two existing RI samples, SPSS-11 and SPSS-15, taken outside of the current estimated boundary of the Mid-Plant area exceed the proposed clean-up standard of 40 ppm. Additional sampling in these areas will be required. The existing sampling point will be used as a center for deriving four 100 ft. grid boxes. At a minimum, four to six samples will be taken in each grid and composited for analysis. If the composited analysis results in an exceedance of the clean-up standard, either the grid may be subdivided into smaller grids to further delineate the areas within the 100 ft. grid exceeding the clean-up standard to be excavated or all the soils within the 100 ft. grid can be excavated to a depth of 1.5 feet. As an alternative, the perimeter edge of the grid may be sampled to define whether the outer edge of the grid is below the clean-up level. If additional sampling within the grid or at the perimeter of the grid indicates that the contamination is contained within the grid space, then the excavation of the contaminated soils to a depth of 1.5 feet would be required. Post-excavation sampling will be from the bottom of the hole and will include, at a minimum, four to six samples. Samples can be composited for analysis. Sidewall sampling will not be required. If additional sampling within the grid or at the perimeter of the grid indicates that arsenic contamination could extend beyond the four grids, then 100 ft. grids will be extended and additional sampling conducted until the lateral extent of the contamination is delineated. Once the extent of the contamination is defined, appropriate remedial options will be examined and considered, including engineering controls and institutional controls. The Agencies would like to emphasize that should the possibility arise that contamination extends beyond the original 200 ft. grids, further characterization of these areas will need to be performed. Additional characterization and, if needed, potential remedial alternatives will be discussed after the data has been collected and reviewed.
- Soils in the Mid-Plant area and the two sampling locations to the south of the Mid-Plant area that are one order of magnitude above (400 ppm), the clean-up standard established by the U.S. EPA (40 ppm), will be disposed off-site at a proper facility. In addition, soils that are believed to contain arsenic concentrations greater than an order of magnitude above the clean-up standard shall be segregated on-site until the excavation activities are complete. Following excavation,

the segregated soils would be sampled in accordance with applicable guidance for determining the quality of stockpiled soils. Those soils found to contain arsenic concentrations an order of magnitude above the clean-up standard would be disposed of off-site. Larger areas of arsenic contaminated surface soils, which are at levels below 400 ppm but above 40 ppm, will be consolidated and disposed on-site in the Eastern Disposal area, prior to construction of the cap. The removed soils will then be included under the single barrier, solid waste cap.

- Even though clean-up at the Mid-Plant Area would be based on exceedances of the 40 ppm clean-up level for arsenic and confirmational sampling will only be required for arsenic, the clean-up must meet the cumulative risk level of 2.3×10^{-5} as well as the arsenic risk level of 1.7×10^{-5} . This will help account for the additional carcinogenic risk of 6×10^{-6} calculated in the Mid-Plant Area for the additional chemical parameters. The data from the arsenic confirmational sampling would then be used in a risk analysis of the residual arsenic risk present in that particular exposure area. The residual arsenic risk would be added to the risk number calculated for the additional chemical parameters of 6.0×10^{-6} and compared to the overall cumulative risk of 2.3×10^{-5} . Any additional removal would be based on exceedances of the cumulative target risk number of 2.3×10^{-5} . This clean-up will proceed using the assumption that the 6×10^{-6} risk number represents the level of residual risk in the Mid Plant area due to the other carcinogenic compounds. However, should any future data suggest that this assumption is inaccurate, this decision can be revisited. In addition, the U.S. EPA or the Ohio EPA reserve the right to conduct any future sampling they believe necessary at the site.

For the Coke-Oven Gas Blowdown Area, even though the constituents driving this clean-up are different from the Mid-Plant Area, a cumulative risk of 2.3×10^{-5} will also need to be achieved for this clean-up. Confirmational sampling would include the entire list of soils PRGs as shown in Table 2. As mentioned previously, any soils removed from the Coke-Oven Gas Blowdown Area will be properly disposed off-site.

Also, as part of RA-5A, some additional characterization will be required in the area of the former melamine ponds during the remedial design. The extent of this additional data collection will be determined during the remedial design planning phase.

The estimated cost of RA-5A is about \$62,800 more than that for RA-5, not including any costs associated with the additional melamine pond characterization. Additional cost is associated with off-site disposal for material excavated from the Coke-Oven Gas Blowdown Area and potentially the Mid-Plant Area.

RA-5A complies with all location, chemical, and action specific ARARs listed in Tables 1.8, 1.9, and 1.10 of the Final South Point FS dated June 1997. The FS is contained in the Administrative Record.

IX. Statutory Determinations

The following is a brief description how the selected remedy meets the statutory requirements of Section 121 of CERCLA.

Protection of Human Health and the Environment.

U.S. EPA's preferred alternative is believed to provide the best balance of trade-offs among alternatives with respect to the criteria used to evaluate remedies. Current and potential future risks to human health and the environment from the contaminated groundwater will be significantly reduced provided that the landfill caps remain intact, the groundwater containment system is maintained, and site access and use restrictions are strictly enforced. The bulk of the contamination source would remain on-site, but the mobility and volume would be reduced by the caps, and active groundwater containment system. No unacceptable short-term risks or cross-media impacts will be caused by implementation of the selected remedy.

Compliance with Applicable or Relevant and Appropriate Requirements.

The Remedial Action Objectives that the selected remedy must meet are described in Section VIII above. The ARARs for the selected remedy are listed in Tables 1.8, 1.9, and 1.10 of the Final South Point FS dated June 1997. They include the Ohio regulations for applicable action -specific ARARS for landfill closure (OAC 3745-27-11/A, B, G and OAC 3745-27-14/A).

Cost-Effectiveness

The U.S. EPA believes that the selected remedy complies with ARARs and is cost-effective in mitigating the principal risk posed by contaminated groundwater. Section 300.430 (f) (ii) (D) of the NCP requires U.S. EPA to assess cost-effectiveness by evaluating all alternatives which satisfy the threshold criteria: protection of human health and the environment and compliance with ARARs, with three additional balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, and volume achieved through treatment; and short-term effectiveness, to determine overall cost-effectiveness. The selected remedy meets these criteria and provides overall effectiveness in proportion to its cost.

Utilization of Permanent Solutions and Alternative Treatment (or resource recovery) Technologies to the Maximum Extent Practicable (MEP).

U.S. EPA believes that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost effective manner for the South Point Plant Landfill site. Of those alternatives that are protective of human health and the environment and comply with ARARs, the U.S. EPA has determined that the selected remedy provides the best

balance of trade-offs in terms of long-term effectiveness and permanence; reduction of toxicity, mobility, short-term effectiveness; implementability; and cost.

Preference for Treatment as a Principle Element.

As stated previously, if the soils from the Coke-Oven Gas Blowdown Areas, or the potential hot-spots identified in the Mid-Plant Area, fail the TCLP and need to be treated prior to off-site disposal, then the statutory preference for treatment as a principle element of the remedy will be achieved. However, if the excavated soils do not need to be treated, or treatment of the additional principle threats at the site are not found to be practicable, this remedy will not satisfy the statutory preference for treatment as a principle element of the remedy.

Based on the information available at this time, therefore, U.S. EPA believe the preferred alternative would protect human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

X. Explanation of Significant Changes

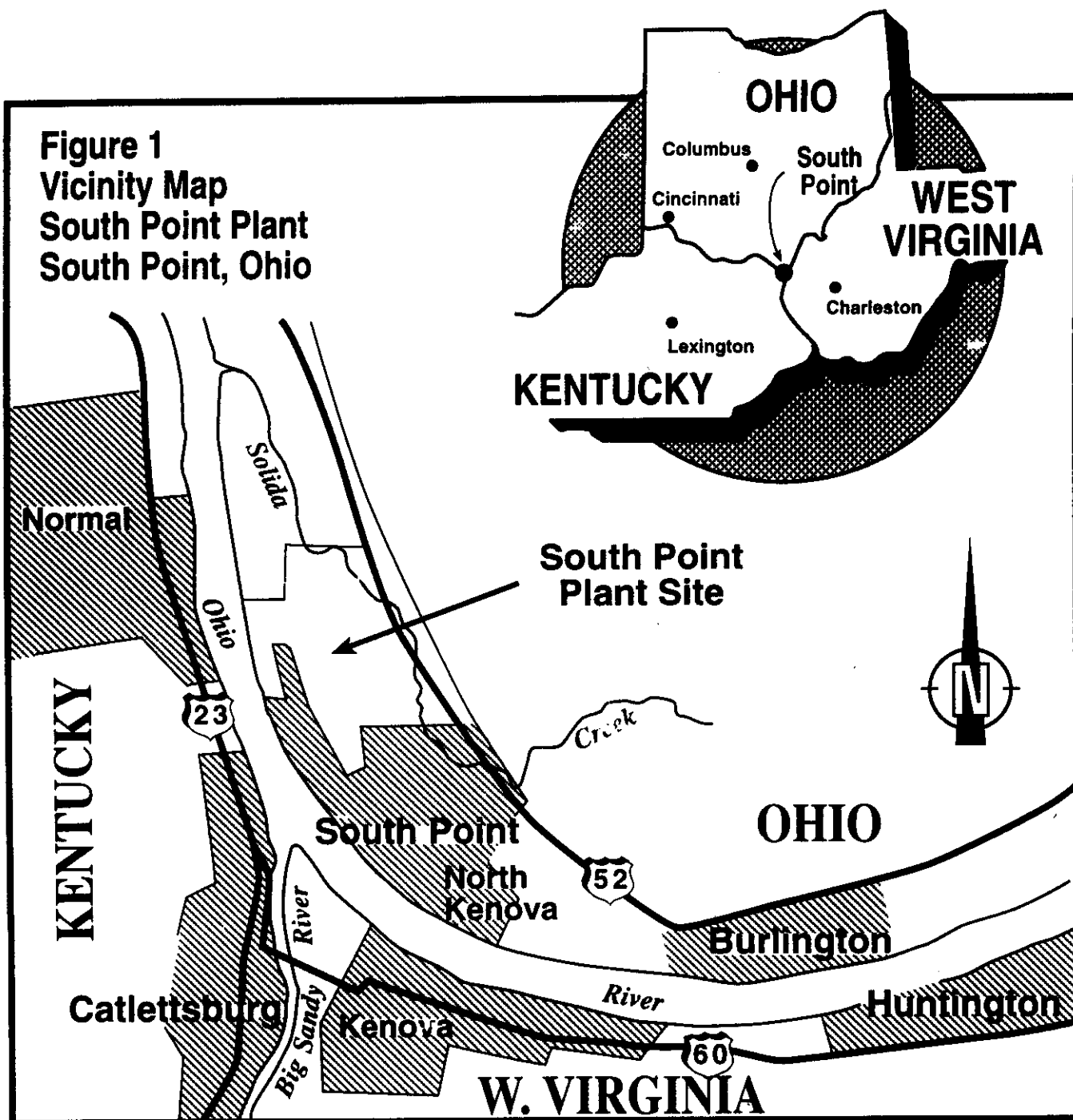
There are no significant changes from the recommended alternative described in the proposed plan.

XI State Concurrence

The State of Ohio has indicated a willingness to concur with this decision. A written confirmation is expected, and will be added to the administrative record upon receipt.

FIGURES

Figure 1
Vicinity Map
South Point Plant
South Point, Ohio



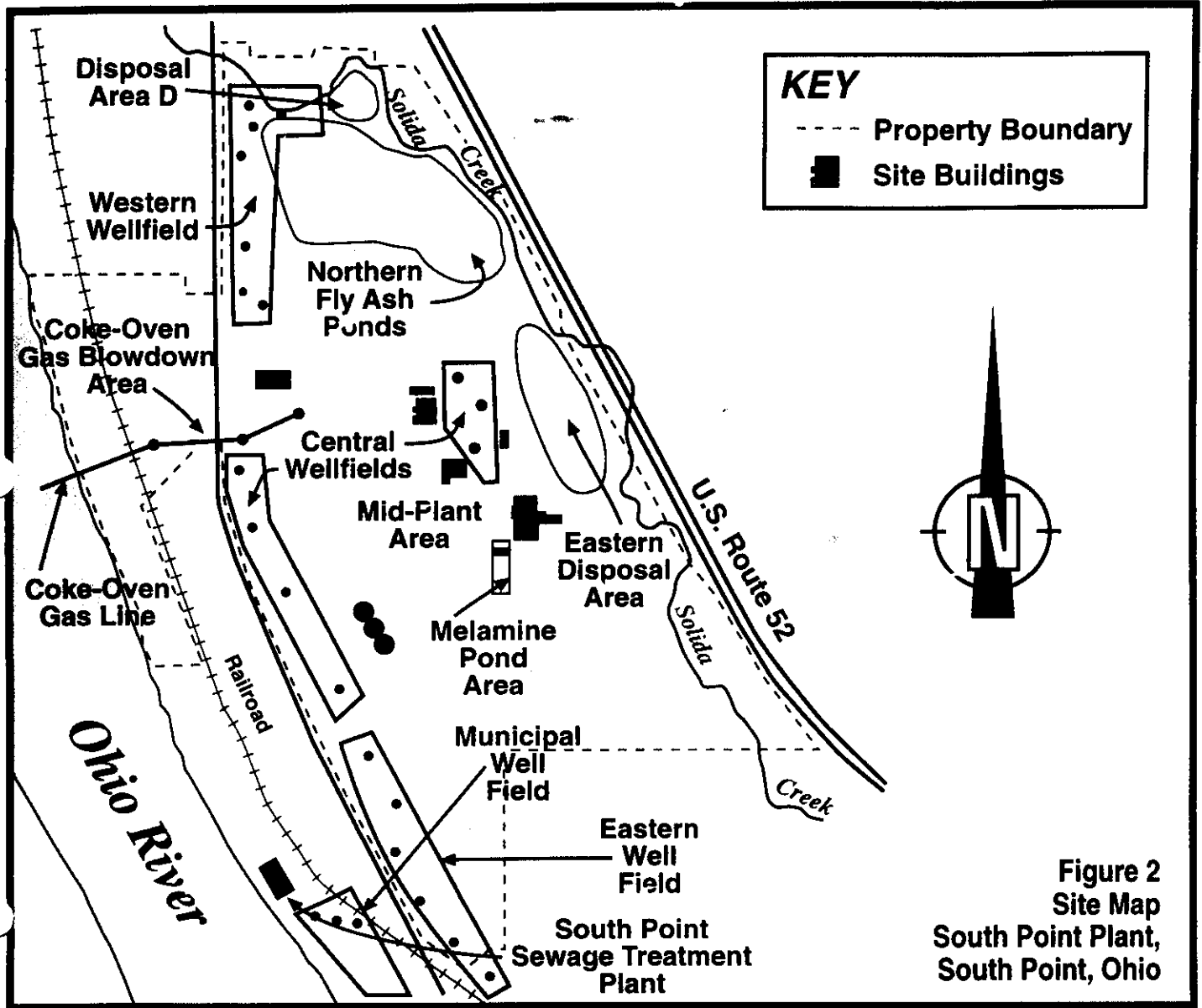


Figure 2
Site Map
South Point Plant,
South Point, Ohio

TABLES

TABLE 1

EVALUATION TABLE

The Evaluation Table below shows that the recommended alternative (Alternative RA-5A) would provide the best balance with respect to the nine criteria. U.S. EPA cannot select an alternative unless it is fully protective of human health and the environment and compliant with the applicable or relevant and appropriate requirements.

EVALUATION TABLE							
Evaluation Criteria	Alternative RA-1	Alternative RA-2	Alternative RA-3	Alternative RA-4	Alternative RA-5	Alternative RA-5A	Alternative RA-6
1. Overall Protection of Human Health & Environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Compliance with ARARs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ¹	<input checked="" type="checkbox"/> ^{1,2}	<input checked="" type="checkbox"/>
3. Long-term Effectiveness and Permanence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4. Reduction of Toxicity, Mobility, or Volume Through Treatment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5. Short-term Effectiveness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6. Implementability	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7. Cost (Estimated)	\$0	\$1,932,750	\$3,314,720	\$2,159,770	\$3,848,010	\$3,910,800	\$7,927,550
8. Support Agency Acceptance	The State of Ohio EPA fully accepts and supports Alternative RA-5A						
9. Community Acceptance	Community acceptance of the recommended alternative will be evaluated after the public comment period						
■ - Fully meets criteria ◐ - Partially meets criteria □ - Does not meet criteria							

This alternative would require that U.S. EPA grant a waiver of certain Ohio EPA hazardous waste requirements.

The Ohio EPA has agreed that such a waiver is appropriate in this instance for this alternative.

Table 2 South Point Plant Preliminary Remedial Goals (PRGs)

Constituent	PRGs
	Soils (mg/kg) - Groundwater (mg/l)
<u>Soil</u>	
1,1 - Dichloroethene	10
Benzo(a)anthracene	18
Benzo(a)pyrene	1.8
Benzo(b)fluoranthene	18
Benzo(k)fluoranthene	180
Chrysene	1,800
Dibenz(a,h)anthracene	1.8
Indeno(1,2,3-cd)pyrene	18
Antimony	500
Arsenic	40
Barium	88,000
Beryllium	14
Cadmium	630
Chromium	6,300
Thallium	100
Vanadium	8,800
<u>Groundwater</u>	
Ammonia	30
Arsenic	0.05
Beryllium	0.004
Cadmium	0.005
Copper	3.8
Manganese	1.4
Nickel	2
Nitrate	10

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY
SOUTH POINT
SOUTH POINT, LAWRENCE COUNTY, OHIO

PURPOSE

This responsiveness summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1986 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires the United States Environmental Protection Agency (U.S. EPA) to respond to each of the significant comments, criticisms, and new data submitted in written and oral presentations on a proposed plan for remedial action. The responsiveness summary provides a summary of residents' comments and concerns identified and received during the public comment period, and U.S. EPA's responses to those comments and concerns. All comments received by U.S. EPA during the public comment period were considered in the selection of the remedial alternative for the Plant. The responsiveness summary serves two purposes: it summarizes community preferences and concerns regarding the remedial alternatives, and it shows members of the community how their comments were incorporated into the decision-making process.

This document summarizes written and oral comments received during the public comment period of August 14, 1997 to September 12, 1997. The comments have been paraphrased to efficiently summarize them in this document. The public meeting was held at 7:00 p.m. on August 26, 1997, at the South Point City Council Chambers, South Point, Ohio. A full transcript of the public meeting, as well as all site related documents, are available for review at the Information Repositories, located at the South Point Mayor's office, 408 Second Street, and the Briggs Lawrence Library, 317 Solida Road, South Point, Ohio. Questions and one official comment were received during the public meeting. One comment, from a potentially responsible party was mailed to U.S. EPA.

OVERVIEW

Community Concerns

1. Comment: A representative from a local chamber of commerce submitted an official comment during the public meeting. Because of the size of the South Point Plant property and the apparent value to attract industry, the representative requested that the U.S. EPA examine the possibility of releasing portions of the property that are not impacted or affected by Superfund remedial activities.

Response: U.S. EPA is willing to work with local groups, local governments, and landowners at the site and discuss options for releasing portions of the property, not related to the Superfund activity, for industrial purposes. Nationally, U.S. EPA has begun to examine the possibility of deleting or releasing parcels of certain Superfund sites as part of U.S. EPA's Superfund Reforms. Efforts to encourage redevelopment of contaminated sites has resulted

in the formation of the EPA NPL Partial Deletion Workgroup. The Workgroup is developing a pilot program to delete portions of sites on the NPL. If possible, results of the pilot program will be applied to the South Point Plant.

Potential Responsible Parties (PRPs) Concerns

1. **Comment:** One PRP was concerned with the additional sampling proposed for the area that contained the former melamine ponds. In particular, the PRP wanted to "reiterate the factual basis on which the melamine pond was evaluated and eliminated as an issue at the site" and "express our concern that this speculative, investigative element will only add further delay and cost to the process with no commensurate increase in overall remedy protectiveness."

Response: The U.S. EPA acknowledges that decisions were made in the past to eliminate characterization of the former melamine pond area during the course of the remedial investigation. This decision appears to be based on the assumption that the area in question had undergone some clean-up work in the past. At this stage, U.S. EPA has no intention of reopening the remedial investigation, however, based upon data collected during an investigation associated with a tank pull near the former pond area, U.S. EPA believes that enough questions have been raised that additional limited characterization of the area needs to be conducted during the remedial design. While the data collected as part of the tank pull does not conclusively show residual contamination from the former ponds, observations in the field suggested that past decisions to eliminate characterization may have been premature. Keeping in mind that additional characterization will be limited, U.S. EPA does not believe that the addition of this element to the remedial design will result in any excessive delays or costs to the project. At the same time, because of the lack of data previously collected in the area, additional characterization will provide the information necessary to address questions concerning the former ponds. U.S. EPA would also like to emphasize, that at this stage only limited data collection efforts have been proposed. Because of the uncertainty surrounding the former melamine pond area, U.S. EPA feels it is prudent to collect and analyze additional data prior to making further decisions on the need for any additional investigations or response actions.

APPENDIX B

Administrative Record

AR

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
SOUTH POINT PLANT SITE
SOUTH POINT, OHIO

ORIGINAL
AUGUST 6, 1997

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	06/03/81	Shields, E., Allied Corporation	U.S. EPA	Notification of Hazardous Waste Site	2
2	06/07/81	Williams, D., Ashland Oil, Inc.	U.S. EPA	Notification of Hazardous Waste Site	2
3	04/20/83	Byram, S., Ecology and Environment, Inc.	U.S. EPA	Site Inspection Report for the Allied Chemical Ethanol Plant Site	12
4	04/27/83	Perenchio, L., Ecology and Environment, Inc.	U.S. EPA	Preliminary Assessment for the South Point/ Allied Chemical Ethanol Plant Site	6
5	12/20/85	Constantelos, B., U.S. EPA	Addressees	Sample Letter re: Notice of Potential Responsibility (UNSIGNED) w/Attached PRP Mailing List	6
6	04/21/87	U.S. EPA/ Ohio EPA	Respondents	Administrative Order on Consent re: the South Point Plant Site	39
7	05/05/87	U.S. EPA	Public	News Release: EPA Seeks Public Comment on South Point Plant Investigation	2
8	10/00/88	Geraghty & Miller, Inc.	U.S. EPA	Technical Memorandum: Site Well Survey and Locations of Proposed Monitor Wells at the South Point Plant Site	13
9	02/00/89	Geraghty & Miller, Inc.	U.S. EPA	RI/FS Quality Assurance for the South Point Plant Site	229
10	02/00/89	Geraghty & Miller, Inc.	U.S. EPA	RI/FS Sampling Plan for the South Point Plant Site	206
11	03/00/89	Geraghty & Miller, Inc.	U.S. EPA	Technical Memorandum: Results of the Geophysical Survey Conducted at the South Point Plant Site	71
12	05/00/89	U.S. EPA	Public	Fact Sheet: Environ- mental Investigation to Begin at the South Point Plant Site	6

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
13	05/02/89	U.S. EPA	Public	News Release: U.S. EPA Begins Study of South Point Plant; To Hold Information Session May 9, 1989	2
14	04/00/90	U.S. EPA	Public	Fact Sheet: Community Update Concerning the South Point Plant Site	2
15	10/00/90	Geraghty & Miller, Inc.	U.S. EPA	Preliminary Remedial Technologies Assessment for the Allied-Signal South Point Plant Site	47
16	05/00/91	Geraghty & Miller, Inc.	U.S. EPA	Source Area Technologies Assessment for the Allied-Signal South Point Plant Site	115
17	11/26/91	Niedergang, N., U.S. EPA and J. Tiell, Ohio EPA	Ford, R., Allied-Signal, Inc.; et al.	Letter re: South Point Plant Site Conceptual Site Model Dispute Resolution	5
18	01/30/92	Geraghty & Miller, Inc.	U.S. EPA	RI/FS Ground-Water Flow and Solute Transport Analysis for the South Point Plant Site (FINAL REPORT)	106
19	04/14/92	Geraghty & Miller, Inc.	U.S. EPA	Ecological Assessment of the South Point Plant Site	272
20	08/00/92	U.S. EPA	Public	Fact Sheet: Community Update Concerning the South Point Plant Site	4
21	02/02/93	Geraghty & Miller, Inc.	U.S. EPA	Baseline Risk Assessment for the South Point Plant Site: Volume I (Text, Tables and Figures)	186
22	02/02/93	Geraghty & Miller, Inc.	U.S. EPA	Baseline Risk Assessment for the South Point Plant Site: Volume II (Appendices)	566
23	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 1 (Text)	415
24	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 2 (Tables)	229
25	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 3 (Figures and Plates)	166

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
26	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 4 (Appendices A-C)	234
27	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 5 (Appendices C-F)	443
28	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 6 (Appendices G-H)	433
29	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 7 (Appendices I-L)	407
30	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 8 (Appendices M-O)	421
31	08/00/94	Geraghty & Miller, Inc.	U.S. EPA	Remedial Investigation Report: Volume 9 (Appendices P-V)	765
32	08/00/95	U.S. EPA	Public	Fact Sheet: Remedial Investigation Completed at the South Point Plant Superfund Site	6
33	05/28/97	Mankowski, M., U.S. EPA and E. Treadway, Ohio EPA	Metcalf, T., Allied-Signal, Inc.	Letter re: U.S. EPA's Approval of the South Point Feasibility Study w/Attached Revised Health Based Goal Tables to be Added as an Addendum to the FS	4
34	06/00/97	Geraghty & Miller, Inc.	U.S. EPA	Feasibility Study (FINAL)	570